What we claimed are:

SUB Q'

1. A method of controlling an optical wavelength division multiplexing transmission apparatus which is equipped with an optical attenuation section for attenuating individually the power level of each of a plurality of input optical signals of different wavelengths, an optical multiplexing section for multiplexing the optical signals of each wavelength which have been attenuated by said optical attenuation section and generating a wavelength division multiplexed optical signal, an optical amplification section for amplifying the wavelength division multiplexed optical signal generated by said optical multiplexing section, and a spectral analysis section for analyzing the spectrum of the wavelength division multiplexed optical signal amplified by said optical amplification section, wherein said method comprises:

an initial setting step which, upon startup of said optical wavelength division multiplexing transmission apparatus, sets initial information including the wavelengths being used and the number of wavelengths being used, sets the amount of optical attenuation corresponding to each wavelength of said optical attenuation section to a maximum value, and sets the operation of said optical amplification section to automatic level control,

a level adjustment step which, upon input of an optical signal of a wavelength corresponding to the wavelengths being used set in said initial information into said optical attenuation section, controls the amount of optical attenuation corresponding to the wavelength of the optical signal being input into said optical attenuation section so that the power level of the optical signals of each wavelength analyzed by said spectral analysis section are approximately constant, and moreover so that the optical power level per single wavelength of the wavelength division multiplexed optical signal input into said optical amplification section is of a level which corresponds with the number of wavelengths being used set in said initial information, and

an operation step which, based on the analysis results from said spectral analysis section, controls the amount of optical attenuation corresponding to the wavelength of the optical signal being input into said optical attenuation section, so that the level conditions adjusted by said level adjustment step are maintained.

~~2. A method of controlling an optical wavelength division multiplexing~~ transmission apparatus ~~according~~ to claim 1, further comprising a wavelength ~~number variation processing step, which upon a variation in the number of~~

wavelengths being input during said operation step, switches the operation of said optical amplification section from automatic level control to automatic gain control, and controls the amount of optical attenuation corresponding to the wavelength of the optical signal being input into said optical attenuation section so that the power level of the optical signal of each wavelength analyzed by said spectral analysis section following the wavelength number variation is approximately constant, and moreover so that the optical power level per single wavelength of the wavelength division multiplexed optical signal input into said optical amplification section is of a level which corresponds with the number of wavelengths following variation.

3. A method of controlling an optical wavelength division multiplexing transmission apparatus according to claim 2, wherein said wavelength number variation processing step, upon any reduction in the number of input wavelengths, sets the amount of optical attenuation corresponding to the interrupted wavelengths of said optical attenuation section to a maximum value.

4. A method of controlling an optical wavelength division multiplexing transmission apparatus according to claim 1, further comprising a spectral analysis anomaly processing step which upon occurrence of an anomaly in the analysis operation of said spectral analysis section during said operation step, controls the amount of optical attenuation corresponding to each wavelength in said optical attenuation section so that the level of the optical signal of each wavelength output from said optical attenuation section is maintained at the output level which existed immediately prior to the occurrence of the anomaly.

5. A method of controlling an optical wavelength division multiplexing transmission apparatus according to claim 1, further comprising a supervisory control processing step, which, when the operation of said optical amplification section is switched to either automatic level control or automatic gain control, generates a supervisory control signal, which shows at least the operating conditions of said optical amplification section following switching, and then send it to the transmission path,

wherein said supervisory control signal is used for switching the operation of optical amplification sections incorporated in subsequent stage devices connected to said transmission path so as to match the operating conditions of the optical amplification section of said wavelength division multiplexing optical transmission

apparatus.

6. A method of controlling an optical wavelength division multiplexing transmission apparatus according to claim 5, wherein said supervisory control processing step utilizes a supervisory control channel of different wavelength from the wavelengths of the optical signals incorporated in said wavelength division multiplexed optical signal, to send said supervisory control signal to the optical transmission path together with said wavelength division multiplexed optical signal.

7. A method of controlling an optical wavelength division multiplexing transmission apparatus which is equipped with an optical attenuation section for attenuating individually the power level of each of a plurality of input optical signals of different wavelengths, an optical multiplexing section for multiplexing the optical signals of each wavelength which have been attenuated by said optical attenuation section and generating a wavelength division multiplexed optical signal, an optical amplification section for amplifying the wavelength division multiplexed optical signal generated by said optical multiplexing section, and a spectral analysis section for analyzing the spectrum of the wavelength division multiplexed optical signal amplified by said optical amplification section, wherein said method comprises:

an initial setting step which upon startup of said optical wavelength division multiplexing transmission apparatus, sets initial information including the wavelengths being used and the number of wavelengths being used, sets the amount of optical attenuation corresponding to each wavelength of said optical attenuation section to a maximum value, and sets the operation of said optical amplification section to automatic level control, and

a level adjustment step which, upon input of an optical signal of a wavelength corresponding to the wavelengths being used set in said initial information into said optical attenuation section, controls the amount of optical attenuation corresponding to the wavelength of the optical signal being input into said optical attenuation section so that the power level of the optical signals of each wavelength analyzed by said spectral analysis section are approximately constant, and moreover so that the optical power level per single wavelength of the wavelength division multiplexed optical signal input into said optical amplification section is of a level which corresponds with the number of wavelengths being used set in said initial information.

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